

Novel stool-based protein biomarkers for improved colorectal cancer screening Meike de Wit DCCG middag 6 juli







The MEDOCC plan



CRC screening in the Netherlands

- > Started in 2014
- > All persons 55-75 year: biennial FIT
- > Expected number of lives saved yearly 2400



FIT performance at specificity ~95%*

Sensitivity: **Room for improvement!!** CRC: ~65% Precursor lesions (advanced adenomas): ~27%

* Van Veen W et al, Colorectal cancer screening: advice from the Health Council of the Netherlands, *Ned.Tijdschr.Geneesk.*, 2009

Molecular changes as biomarkers in stool



Workflow: Proteomics Laboratory MS-based protein identification in stool



Hemoglobin: sensitivity of 43% **for detection of CRC** at 95% specificity.



Marker panel: sensitivity of 71% *versus* 43% Hemoglobin alone at 95% specificity.





Hemoglobin: sensitivity of 8% for **detection of advanced adenomas** at 95% specificity.



Marker panel: Sensitivity of 40% versus 8% Hemoglobin alone at 95% specificity.





Does it work in a small FIT sample?

FIT ~ 10 mg stool Multiplexed antibody-based assay



• Off the shelf assay for 4 out of top 50 (NOT top 4) proteins

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FIT samples (50 μ l) n = 72



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Validation in FIT samples



Assay development for 10 selected candidates



Prospective cross-sectional screening trial within the Dutch CRC screening program n= 10,000

FIT and biomarker test



Prospective cross-sectional screening trial within the Dutch CRC screening program n= 10,000

biomarker test









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Validation FIT sample set for Phase 1



Cocos samples: CRC screening study n=1049





